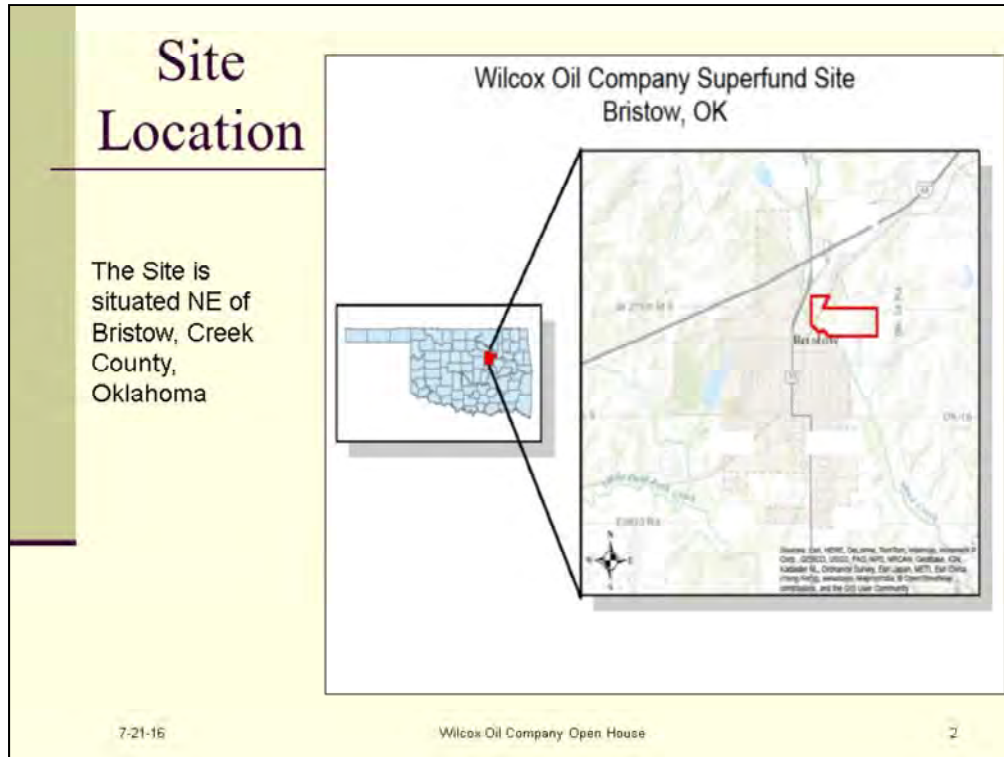



Hello Everyone and Welcome to our open house and project update. My name is Katrina Higgins-Coltrain, and I am the EPA project manager for the Wilcox Oil Company Superfund Site. Also here this evening is **Todd Downham**, who is the Oklahoma Department of Environmental Quality's project manager for this site, and Ms. **Amy Brittain**, ODEQ

It is our job to **coordinate** and work **together** with you to **investigate** the site, keep you updated on **current and planned activities**, address your **questions and concerns**, and finally **clean up** the site. Tonight we want to update you on our progress and planned sampling activities.



The site is located just **northeast** of central Oklahoma and just northeast of Bristow.

## Site Background



Operation:  
Oil Refinery

Activity Period:  
1915 through 1963

Size:  
about 140 to 150  
acres

1950s Aerial Photograph

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The site operated as an **Oil refinery** from about **1915 to 1963**. It is about **140 to 150** acres. This picture was taken sometime in the 1950s and shows the Wilcox plant during operation.

## Site Discovery

- ODEQ Inventory Review
- Site Investigations
  - Preliminary Assessment (PA)
  - Site Inspection (SI)
  - Expanded Site Inspection (ESI)
- Soil data indicated that high concentrations of organics and metals are present.
- National Priorities List
  - Proposed: May 24, 2013
  - Listed: December 12, 2013



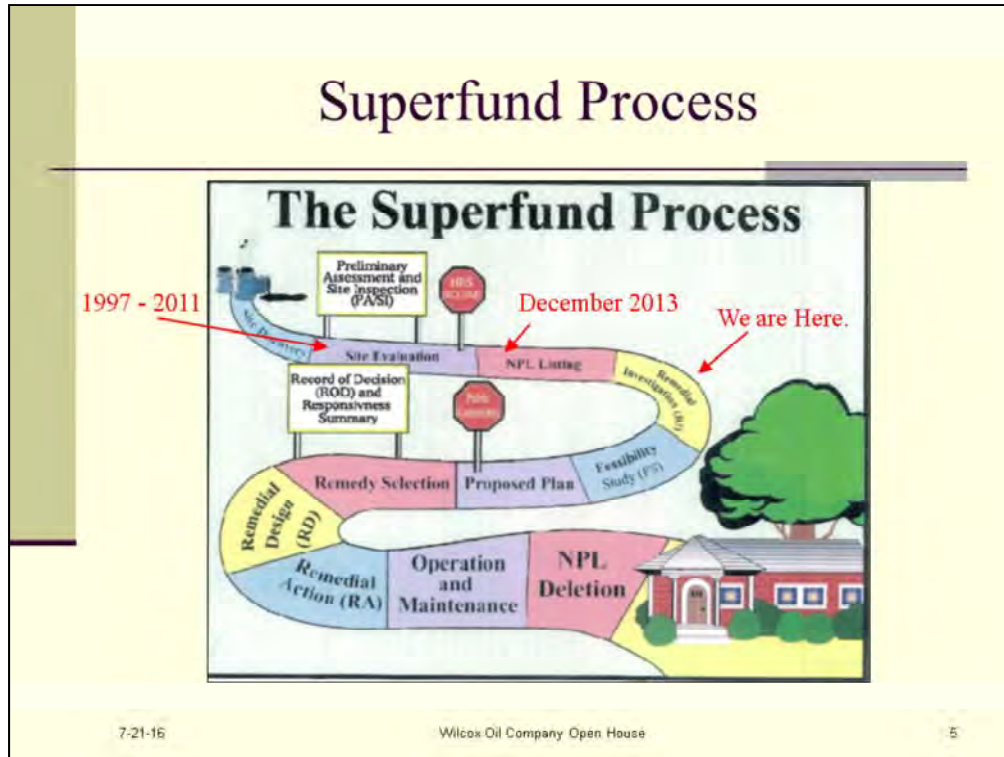
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In the **1960s**, the facility **ceased operations and dismantled** its tanks, operating buildings, and **closed** its ponds/pits.

In the early 1990s, **ODEQ** began to **research** its **oil history** in an attempt to identify historic refinery locations. Through this process, Lorraine and Wilcox were identified.

Through a **series of investigations** performed by ODEQ and EPA, data were collected that indicated high concentrations of organics and metals were present.

After evaluation through the **Hazard Ranking System**, the site was proposed to the National Priorities List in May 2013 and finalized on that list in December 2013.



When a site is **placed on the NPL**, it is evaluated under the **Comprehensive Environmental Response, Compensation, and Liability Act**, or as it's commonly called, Superfund.

The Superfund Process **consists of many steps and takes multiple years** to complete. It begins with site discovery, .....(summarize each step briefly).

Throughout this process we **work to keep the community updated** through periodic meetings and fact sheets. This is just one in a **series of meetings** that we plan to have so that we can update you on **our progress, our findings, and our future plans**.

As you can see, **we are near the beginning of the process**.

We completed the site evaluation step in 2011 and the site was placed on the NPL in 2013. We are now in the Remedial Investigation Stage.

## Remedial Process

- Remedial Investigation collects data to:
  - Determine Site conditions
  - Determine nature of wastes
  - Evaluate risk from the Site to human health and environment
- Feasibility Study (FS) develops, screens, and evaluates different cleanup options

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### What does the RI Process include?

The RI includes the **collection and evaluation** of data to.....

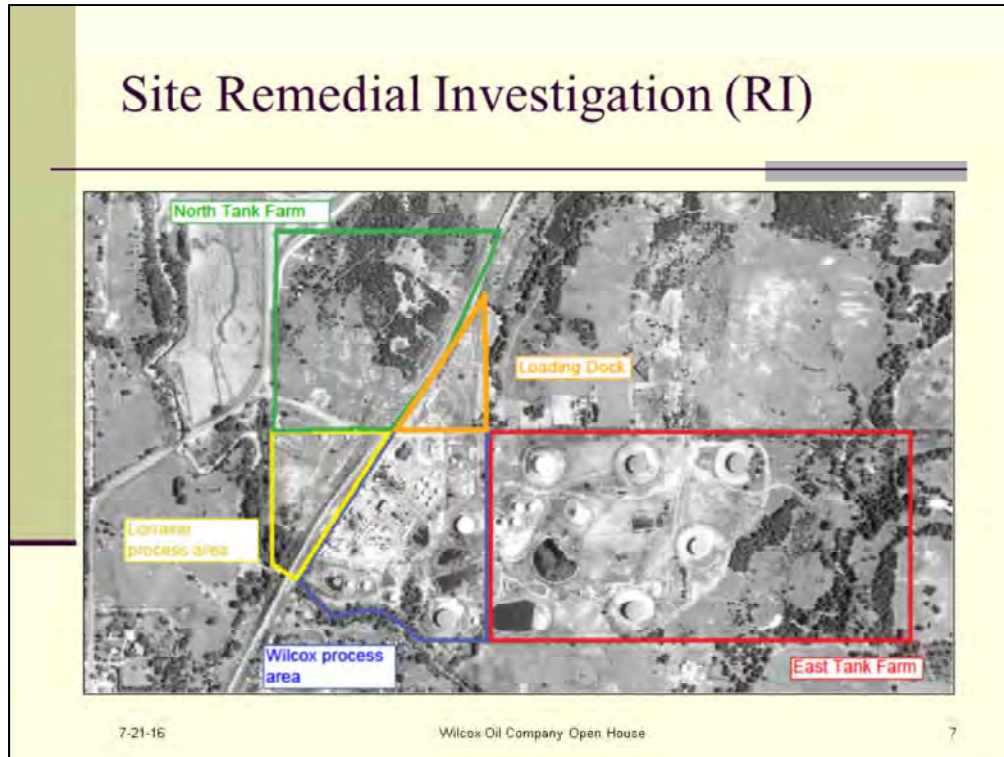
For example, we need to know **where the contamination** is, **how much** contamination there is, and how **deep** the contamination is. We need to know **where ground water** exists and how it is moving.

We need to know what **kind of contamination** we have and **what contaminants are present**. We need to know **how these contaminants move through the environment** and how they might **affect or pose a potential risk** to humans and the environment.

Once we know this information, we **begin to identify potential technologies** that can be used to cleanup the **volume and type of contamination** at the site. This is done through a Feasibility Study.

We are currently collecting site data to better understand the type of contamination and the location of that contamination.





The **site has been broken down into 5 areas based on operating history**. This is a 1956 aerial photograph that shows each of the site's operation areas.

North Tank Farm: old Lorraine Refinery (~27 acres)

Lorraine Process Area (~9 acres) 42000 gal capacity tanks (~15-20 tanks)

Wilcox Process Area (~27 acres)

Loading Dock (~7 acres)

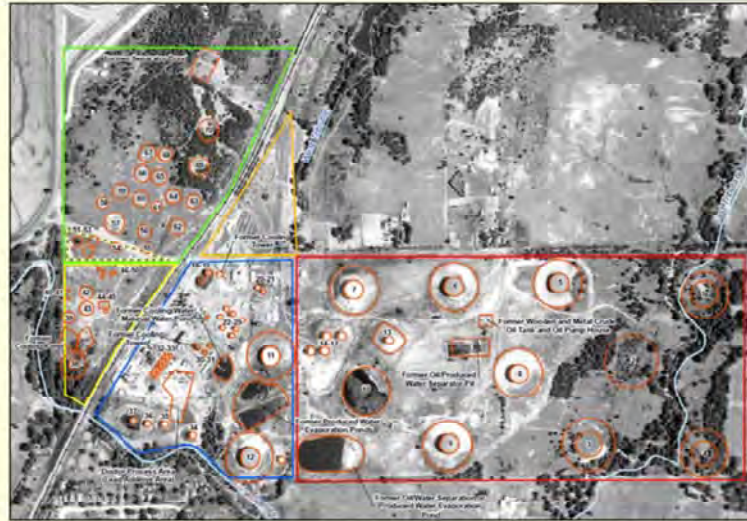
East Tank Farm: old Wilcox Refinery (~80 acres) 55,000barrel capacity tanks (10-15 tanks)

Some wastes that may be associated with this type of facility include **crude oil, tank residues, brine, acid and caustic residue, heavy metals, petroleum products, coke, sulfur compounds, and solvents**. Waste management practices are unknown for this facility.

Lorraine: 1915 to 1937. Wilcox purchased Lorraine in 1937.

Wilcox: 1920 to 1963: upgraded from a 1000 barrel a day operation to a 4000 barrel a day operation in 1929.

## Site Remedial Investigation (RI)



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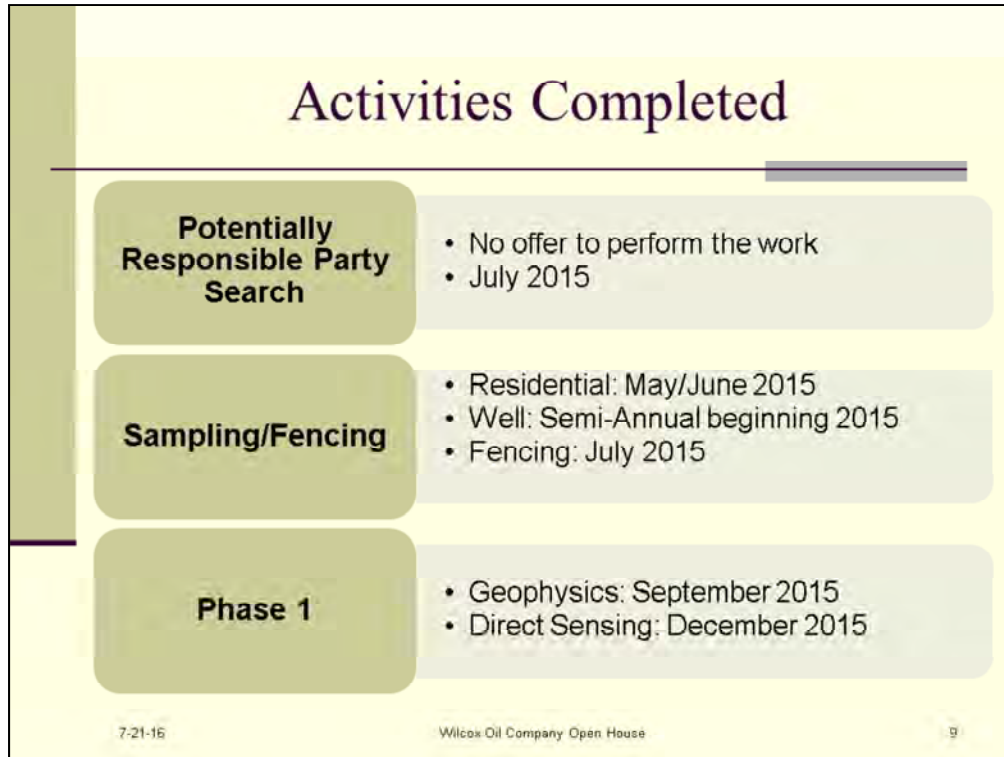
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This figure shows some of the features associated with the refinery operations.

The Sanborn Insurance Maps indicate that the property contained about **80 storage tanks of various sizes**, a cooling pond, separation ponds, and around **10 or more buildings housing refinery operations**. The map also indicated that **crude oil, fuel oil, gas oil, distillate, kerosene**, and benzene (petroleum ether) were all stored on the property by the Lorraine /Wilcox Refining Company.





Since the site was placed on the **NPL**, we have completed several activities.

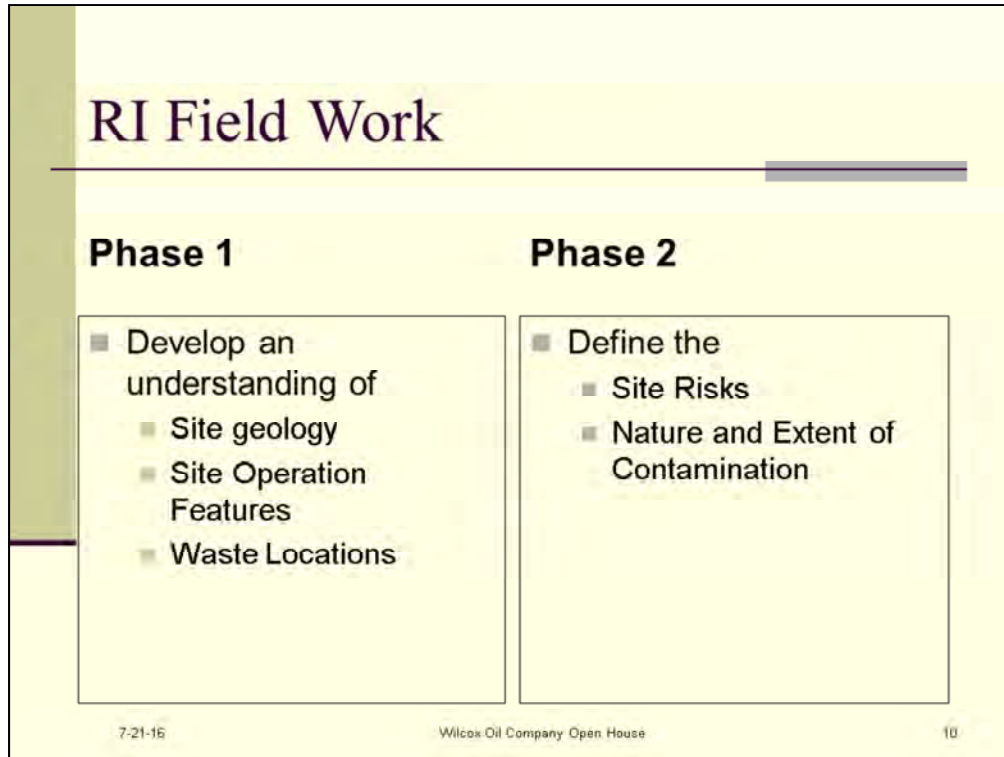
We completed **two searches for potentially responsible parties**. We offered 5 parties the option to negotiate with us to perform the work. All parties have declined. Based on our **review of the responses and our research**, we decided that no further enforcement action would be beneficial and we should move forward with the RI phase.

In May/June 2015, we completed sampling **9 residential properties** located within or near the boundary of the site. We met with the residents individually about the data results for their property.

At this time, **no immediate health risks are identified and no immediate response** is needed.

In July 2015, we completed **fencing** around additional areas of concern to limit and restrict trespassing.

During September and December 2015, we completed Phase 1 investigation activities: a **geophysics** investigation and a **direct sensing** investigation.



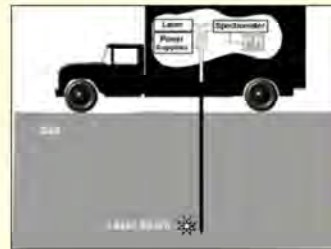
We have **broken the field work into manageable phases or steps** so that we can **build** upon our previous understanding and **fill any data gaps or questions** we may have.

Under **Phase 1 field work** we developed a better understanding of .....

Under **Phase 2**, we will refine our understanding and further define.....

## RI Field Work – Phase 1

- Geophysical Survey
  - Ground Penetrating Radar
  - Electromagnetic Survey
  - Trenching
- Soil and Contaminant Survey
  - Cone Penetrometer
  - Light Induced Fluorescence



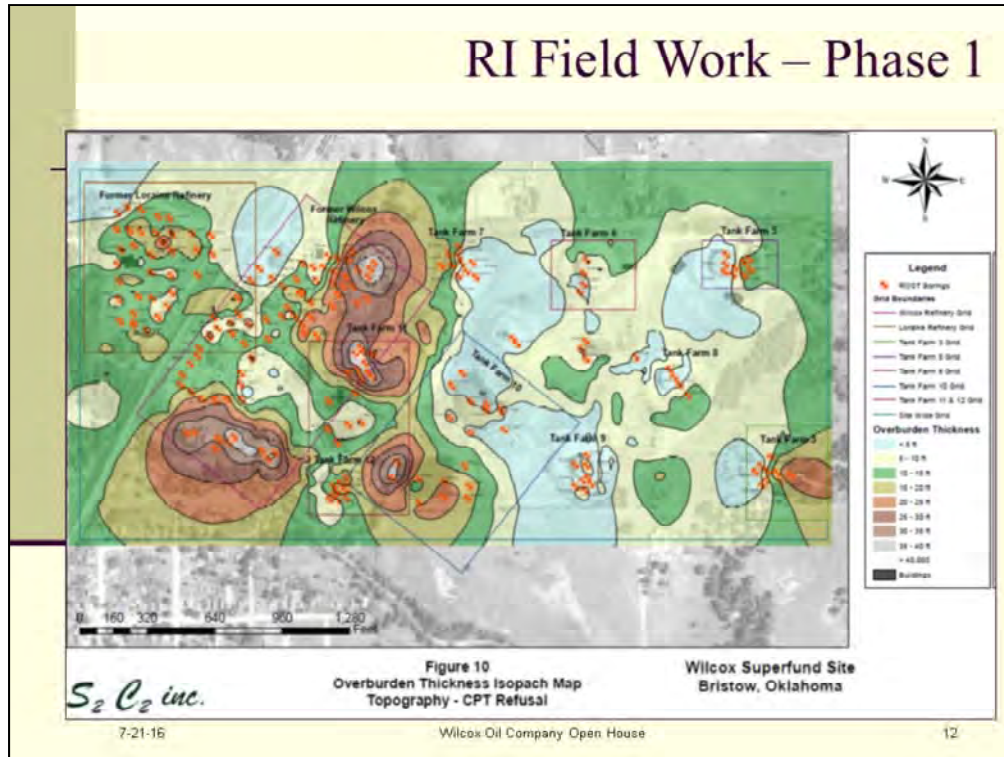
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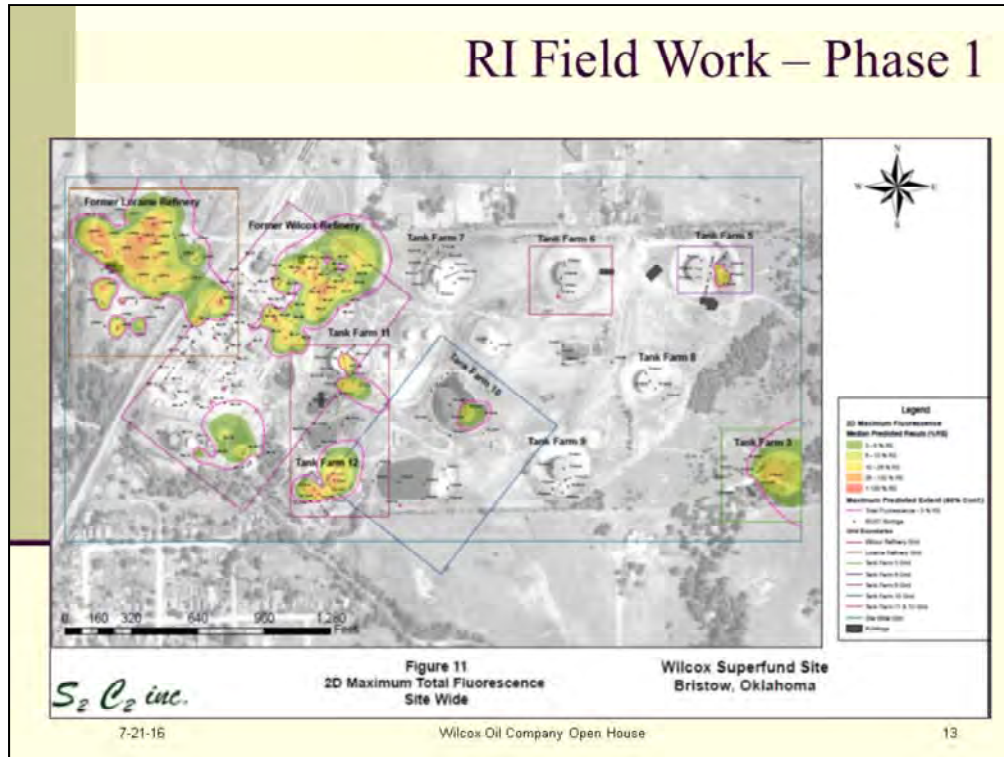
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Under Phase 1, we completed a geophysics survey and a soil/contaminant survey.

These technologies provided us with **information about the subsurface** so that we can identify the different **layers of rock and soil** as well as the presence or absence of **waste material**. These technologies also assisted with the identification of underground obstructions such as piping or foundations.



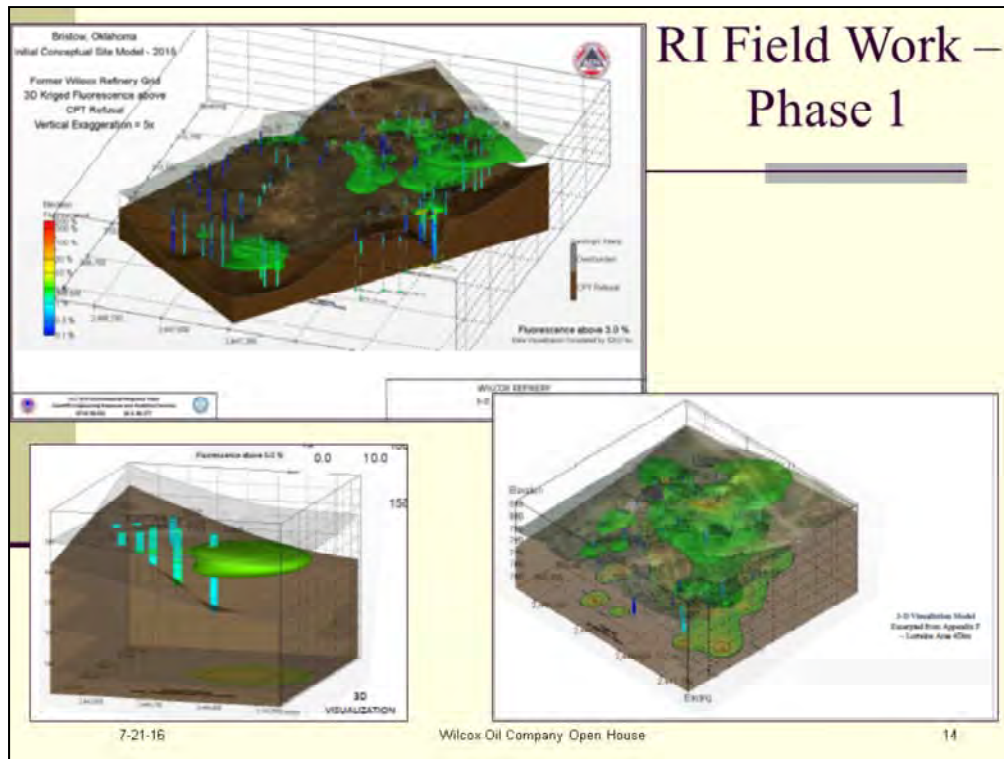
Using the geophysics **surveys**, we are able to **determine the soil thickness and the depth to bedrock and/or underlying refusal layer**. Based on these data, the soil depth and depth to bedrock **increase as we move west and south towards Sand Creek**.



Using the **light induced fluorescence** technology, we are able to **identify potential waste source areas**. The light induced fluorescence sends out **ultraviolet light** into the surrounding soils. The contaminants in the oil waste fluoresce when hit with the UV light and the location is recorded. Based on the fluorescence signatures, we are **able to map potential waste source areas**. Because the light induced fluorescence technology only **provided screening data**, these areas will need to be **investigated further** to identify the **type and concentration of the contaminant present**.

As you can see from this map, the fluorescence signatures are larger in the two refinery areas. Some additional areas include former tank locations.





Not only did the **light induced fluorescence** provide us with a horizontal indication of potential waste material, but it also provided a **vertical indication or depth profile of the potential waste material**. Using that information, these **3D images** of the subsurface and the depth location of the potential waste material **were developed**.

As you can see from these maps, the potential waste material **ranges between 5 and 20 feet below ground surface**.

## RI Field Work - Phase 2 - Mobilization 1

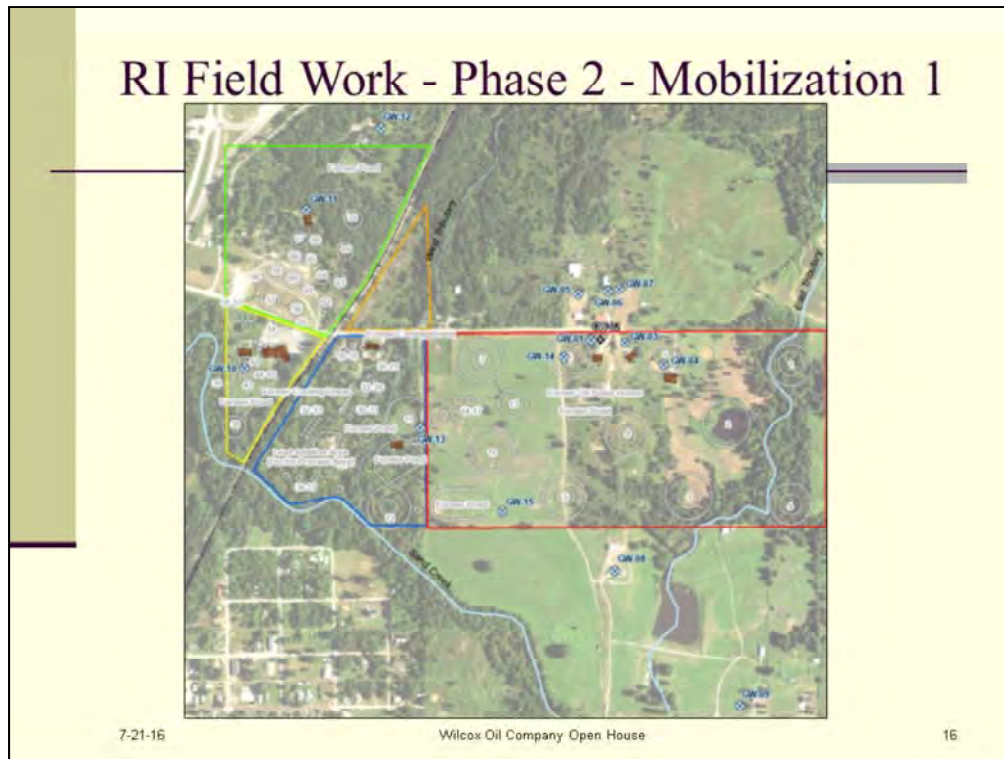
- **Site Work Plans**
  - Began Development - December 2015 - Based on Phase 1 Data
  - Finalize Mobilization 1: August 2016
- **Site Field Work**
  - August/September 2016
  - Ground Water, Soil, and Vapor Sampling
  - Time permitting: surface water and sediment sampling

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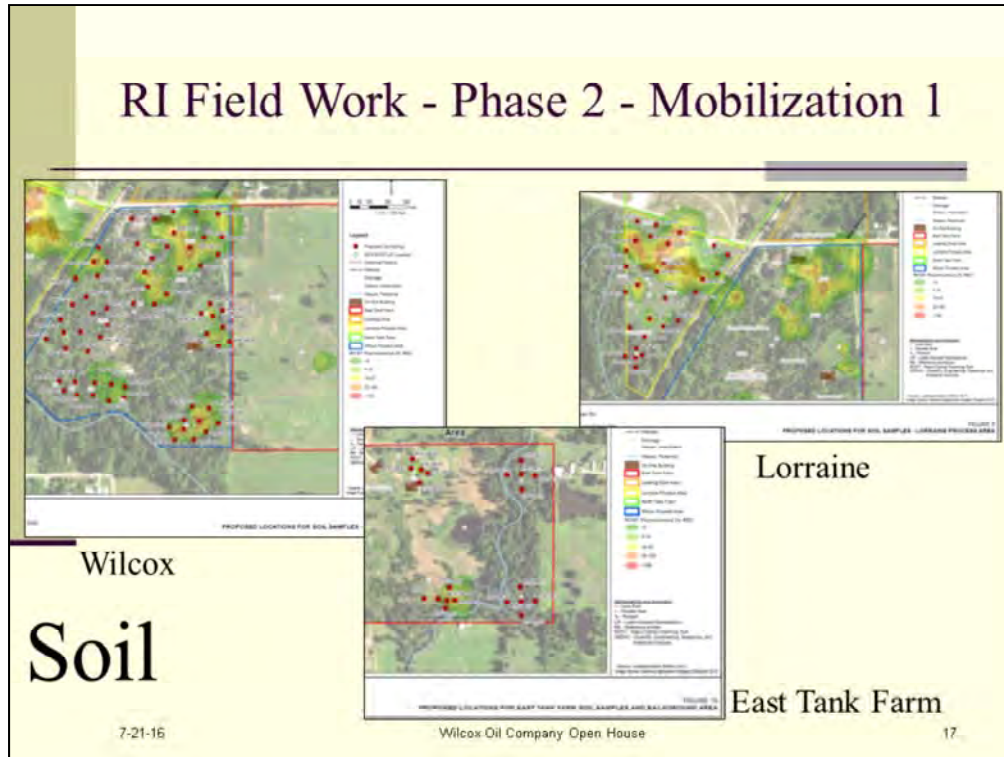
Under **Phase 2 Mobilization 1**, we used the results from the Phase 1 investigations to develop a sample plan. The field work will be conducted during several mobilization events. Mobilization 1 is planned for August/September 2016.

Mobilization 1 will include ground water sampling of existing wells and soil sampling in around the potential waste source areas to identify the contaminants present and define the concentration extent (horizontal and vertical).

The next few slides **provide pictures and examples of the technologies we will be using and where we plan to use them.**



Approximately 14 wells may be sampled. This sampling will supplement the sampling that is currently being conducted by ODEQ.



The **red dots** represent the **planned locations for soil borings**. These locations were **selected based on the results** from the light induced fluorescence survey. These soil borings **will provide us with data** that will further our understanding of **what waste source material is present**, will refine the **horizontal and vertical extent**, and will **identify the contaminants that are present as well as their concentrations**.

In addition, the soil borings are located **along areas that may be in contact with Sand Creek**. These boring will provide data that will assist us in understanding whether **contamination is moving from the site and into the creek**.

During Mobilization 1, we will be taking soil samples from several depths and analyzing them for organic and inorganic contaminants.

We have planned to sample

Approximately 28 locations on Lorraine

Approximately 64 locations on Wilcox

Approximately 21 locations in the East Tank Farm

## RI Field Work - Phase 2 - Mobilization 1

### Soil



Direct Push



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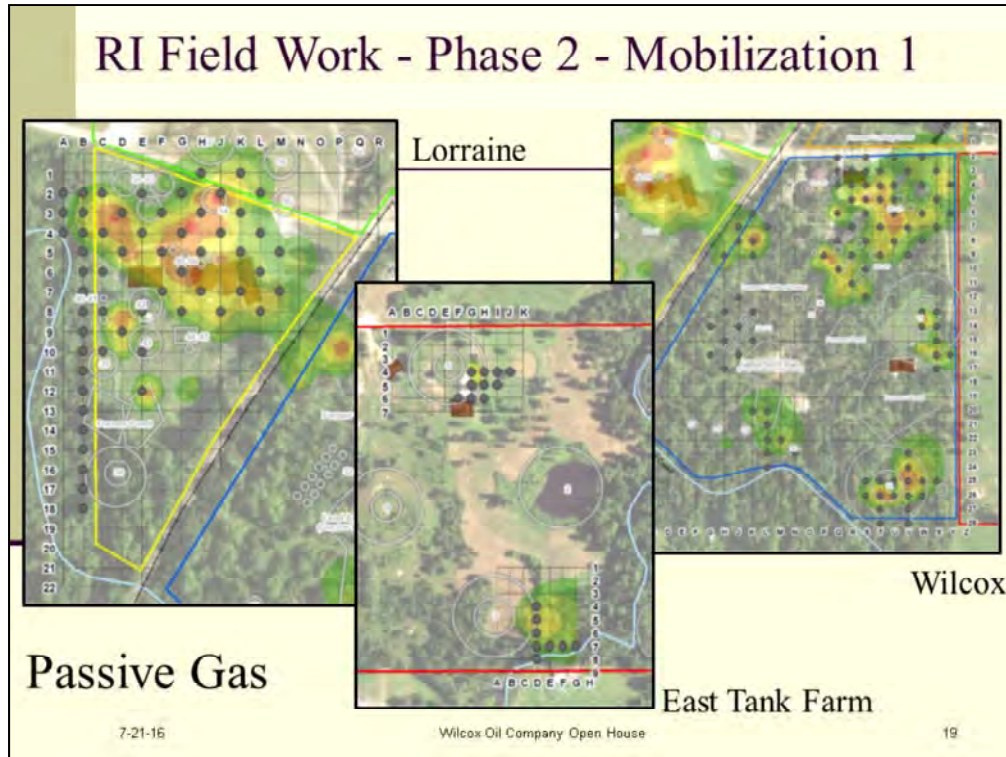
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The soil will be sampled using several field methods including

- Trowels
- Hand augers
- Direct push
- Hollow-stem auger





One of the media we are concerned about is **air**, specifically **vapors that can be produced from the waste source material**. We will be using **passive gas samplers** to **map** locations where **vapors** from the waste source material may be present. We will also be **sampling indoor air** within three buildings that are located within the former process area boundaries for Wilcox and Lorraine to **determine if these vapors are moving into the buildings where people can breathe them**.

During Mobilization 1, we are planning to sample  
 Approximately 57 locations on Lorraine,  
 Approximately 93 locations on Wilcox, and  
 Approximately 18 locations in the East Tank Farm



These are a few pictures of the passive gas and indoor air samplers.

The passive gas samplers are installed in the ground about **18 to 24 inches below ground surface**. They are left in place for **approximately two weeks** before they are retrieved and sent to the lab for analysis. These samples will provide data that will assist us in **understanding where potentially harmful vapors are present**.

The indoor air sampling, typically involves **sampling below the dwelling and within the dwelling**. The **sub-slab sampling** process involves **drilling a small hole** through the slab so that a sample of the soil gas **directly under the dwelling** can be collected. During indoor air sampling, a **canister is placed** in the dwelling for approximately **8 to 24 hours** so that a sample can be collected. These samples will **provide data** that will assist us in understanding whether potentially harmful vapors **are present within and/or below the dwellings and whether there is a potential for exposure to these harmful vapors**.

# RI Field Work - Phase 2 - Mobilization 1

Indoor  
Air



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## RI Field Work - Phase 2 - Mobilization 1



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Time permitting, the **sediment and surface water may be included as part of Mobilization 1**. There are several **ponds and drainages** located throughout the site. In addition, **Sand Creek** borders the site to the west and southwest.

Sediment and surface water samples will be collected from several pond, drainage, and creek locations and will be analyzed for organic and inorganic contaminants.

We are planning to sample

Approximately 36 pond locations

Approximately 16 drainage locations

Approximately 20 Sand Creek locations



## RI Field Work - Phase 2 - Mobilization 1



### Sediment and Surface Water

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A variety of field collection techniques may be used.

Clam shell

Trowel

Dip spoon

Wade or by boat



## RI Field Work - Phase 2 - Mobilization 2

- North Tank Farm
- Loading Dock
- Data Gaps from Mobilization 1
- Early 2017



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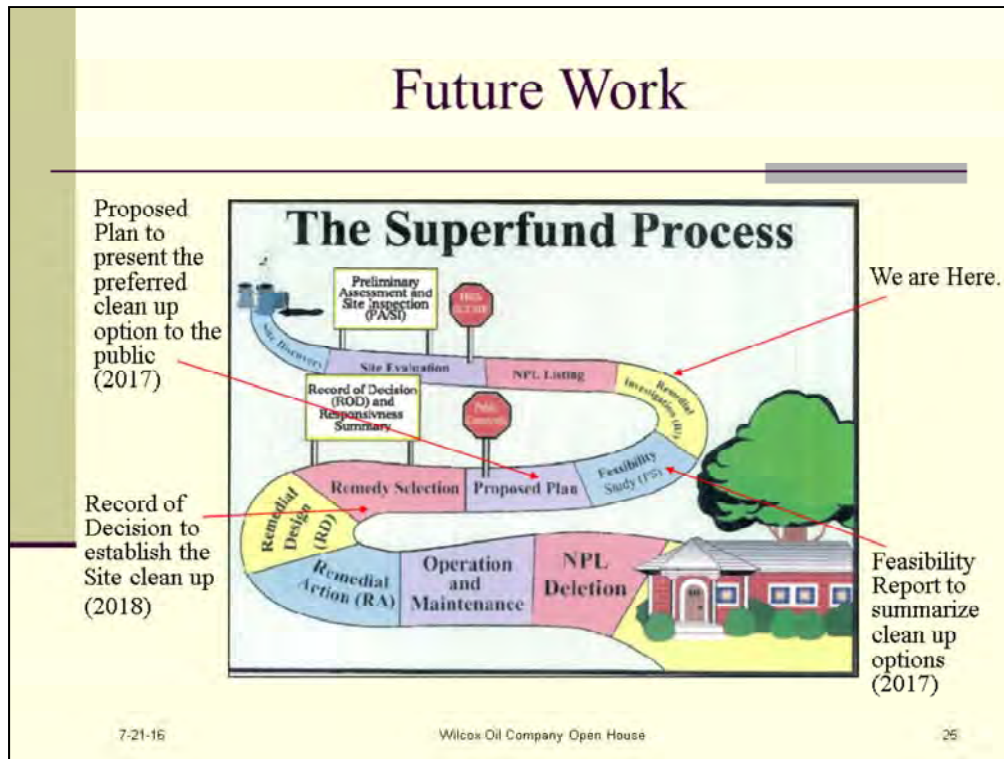
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After Phase 2 Mobilization 1, the data will be reviewed and data gaps will be identified.

The primary focus for Phase 2 Mobilization 2 will be on the **North Tank Farm and the Loading Dock Area**. In addition, Mobilization 2 will work to fill data gaps identified from Mobilization 1.

We expect Phase 2 Mobilization 2 to be conducted in early 2017.



**We are working hard to keep moving forward and stay on schedule. We want to complete field work by early to mid-2017 so that we can move into the next phase called Feasibility study.**

The feasibility study phase is where we **identify and evaluate technologies** that can be used to clean up the contamination.

**Following the RI and the FS, we develop a proposed plan.** The proposed plan presents a summary of the findings from both the remedial investigation and the feasibility study. It summarizes the nature and extent of **site contamination**, the potential **site risks posed by the contaminants**, and it **compares** the technologies reviewed in the FS against each other. **Based on the comparison, the preferred technology/cleanup approach** is identified and **a summary describing why it is selected** as the best solution for cleaning up the site is provided and presented to you for review and comment.

After review and comment, the final cleanup approach is identified in the **Record of Decision**.

Our plan is to complete these activities **within the next 2-3 years**.

## Community Participation

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- Site documents can be found at:
  - Bristow Public Library
  - Oklahoma Department of Environmental Quality
- Web Resources
  - ODEQ: [www.deq.state.ok.us/lpdnew/index.htm](http://www.deq.state.ok.us/lpdnew/index.htm)
  - U.S. EPA: <http://www.epa.gov/superfund/search-superfund-sites-where-you-live>
- Contacts
 

■ EPA, Project Manager: Katrina Higgins-Coltrain	214-665-8143
■ ODEQ, Project Manager: Todd Downham	405-702-5136
■ EPA, Community Involvement: Bill Little	214-665-8131
■ EPA toll-free number	800-533-5308

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Thank you for attending our site update. Our contact information is provided here and in the updated site fact sheets. Please take a copy with you.

Are there any questions we can answer related to the process, the refinery, or the site field work?